

## CASE STUDY - Prying

### TASK TITLE: Prying

<b>Task Description:</b>	<p>This task involves using a pry-bar or crow-bar to loosen or remove a door, lid, or component. In some cases, a screw driver or other tool is enlisted for the task. The working end of the tool is positioned on or near the part that is to be pried apart. Sometimes the pry bar needs to be hammered or forced into place. Once positioned force is applied to the handle to pry apart the two pieces.</p> <p>Typical jobs in which prying is performed include (not necessarily limited to):</p> <ul style="list-style-type: none"> <li>• shipping</li> <li>• warehousing</li> <li>• wood shop</li> <li>• fabrication</li> <li>• maintenance (e.g., tire repair)</li> </ul> <p>The primary ergonomics concern with prying is force.</p>
<b>Job Performance Measures Most Often Impacted by Prying:</b>	Task performed in desired amount of time.
<b>Typical Employee Comments about Prying</b>	<p>Employees typically complain about discomfort and/or stiffness in the shoulders/neck, hands/wrists and sometimes in the back.</p> <p>Primary: hand/wrist/arm and shoulders/neck Secondary: back/torso</p>
<b>Suggested Level II Analysis:</b>	Grip Force Measurement, Dynamic Task Analysis

## Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
1. Reaching	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
2. Arm forces: Repeated contraction of the muscles of the arm or holding/carrying materials	<ul style="list-style-type: none"> <li>High forces required to pry object</li> </ul>	21. Increase handle length to improve leverage <ul style="list-style-type: none"> <li>provide longer pry bars to minimize reaching</li> </ul>		✓	med	med	med
3. High speed sudden shoulder movements	<ul style="list-style-type: none"> <li>High forces required to pry object</li> </ul>	76. Provide a tool which requires minimal force to use <ul style="list-style-type: none"> <li>provide a pry bar with a hammering location</li> <li>use a hammer/mallet to work the component loose gradually</li> </ul>	✓	✓	med low	med med	med med
		32. Lower the work piece/work surface <ul style="list-style-type: none"> <li>this would allow the person to use more of his/her body weight to perform the task while the arms are in a strong position</li> </ul>		✓	med	med	med
		144. Provide a machine/automate <ul style="list-style-type: none"> <li>purchase a machine for tire maintenance</li> </ul>		✓	high	med	high
4. Head/neck bent or twisted	<ul style="list-style-type: none"> <li>Rarely occurs to any significant exposure</li> </ul>	N/A					

## Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
5. Bent wrists repeated wrist movements or repeated forearm rotation	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					

### Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
8. Hand/grip forces	<ul style="list-style-type: none"> <li>Inadequate or slippery grip surfaces on the pry bar</li> <li>Handle is not long enough</li> <li>Resistance between surfaces is high</li> </ul>	54. Provide a high friction gripping surface		✓	med	med	med
		<ul style="list-style-type: none"> <li>provide a tool handle with a compressible grip surface</li> <li>increase “handle” on pry bar; provide space for two-hand grip</li> </ul>		✓	med	med	med
		66. Provide a power tool		✓	high	med	high
		<ul style="list-style-type: none"> <li>provide hydraulic tool separate parts (e.g., jaws of life)</li> </ul>		✓	med	med	med
		21. Increase handle length to improve leverage		✓	med	med	med
		76. Provide a tool which requires minimal force to use		✓	med	med	med
		<ul style="list-style-type: none"> <li>Provide a pry bar with a hammering location</li> <li>Use a hammer/mallet to work the component loose gradually</li> </ul>	✓		low	med	med

### Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
9. High speed hand/wrist/arm movements or vibration, impact, or torque to the hand	<ul style="list-style-type: none"> <li>Manual prying may require repeated, jerky movements.</li> </ul>	66. Provide a power tool <ul style="list-style-type: none"> <li>provide a hydraulic tool to separate parts</li> </ul>		✓	high	med	high
10. Exposure to hard edges	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
11. Hands and fingers exposed to cold temperatures	<ul style="list-style-type: none"> <li>Rarely occurs to any significant exposure level</li> </ul>	N/A					

## **Back/Torso**

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
12. Repeated forward or sideways bending movements	<ul style="list-style-type: none"> <li>Rarely occurs to any significant level</li> </ul>	N/A					
13. Twisting of the lower back	<ul style="list-style-type: none"> <li>Work space or access is limited</li> </ul>	63. Provide a padded, compressible surface to lay on <ul style="list-style-type: none"> <li>Provide a mat to cover sharp or blunt surfaces so that the worker can get closer to the work location</li> </ul>	✓		low	med	med

### Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
14. High speed, sudden movements	<ul style="list-style-type: none"> <li>Forces required to pry object loose</li> </ul>	76. Provide a tool which requires minimal force to use <ul style="list-style-type: none"> <li>Provide a pry bar with a hammering location</li> <li>Use a hammer/mallet to work the component loose gradually</li> </ul>	✓	✓	med low	med med	med med
15. Static, awkward back postures	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A		✓	high	med	high
16. Lifting forces	<ul style="list-style-type: none"> <li>Rarely occurs (if it occurs, see Lifting case study)</li> </ul>	N/A					
17. Pushing or pulling	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>						
18. Whole body vibration	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					

## Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
19. Fixed position, standing	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
20. Exposure to hard edges on legs, knees, and feet	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
21. Awkward leg postures	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
22. Standing foot pedal	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					



## Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
23. Difficult to see/light levels too low/too high	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
24. Intensive visual tasks, staring at work objects for long periods	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					